
Todd (C. A.)

THE
DEATH RATE OF ST. LOUIS.

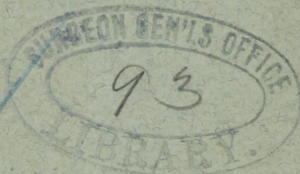
AN INQUIRY INTO

THE CAUSE OF ITS BEING LESS THAN THAT
OF ANY OTHER LARGE CITY OF
THE UNITED STATES.

BY

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ST. LOUIS:
G. I. JONES AND COMPANY.
1879.

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Reported Mortality of Seven Cities, taken from their Official Records.

NAME OF CITY.	ESTIMATED POPULATION.	TOTAL DEATHS, 1877.	DEATHS PER 1,000.
New York.....	1,077,228	26,203	24.32
Philadelphia.....	850,856	16,004	18.81
Brooklyn.....	527,830	11,362	21.53
St. Louis.....	500,000	5,660	11.32
Chicago.....	439,976	8,026	18.24
Boston.....	353,000	7,284	20.34
Cincinnati.....	280,000	4,428	15.81

The city of St. Louis, in respect to its reputation abroad for healthfulness, labors under two disadvantages : First, its bad sanitary record during the early years of its existence, — its present sewer system dating only from 1850 ; secondly, the bitter rivalry that exists between it and the great established commercial centres of the Atlantic coast and their dependencies, which, on the principle that all's fair in war, makes the most of the old ill-repute to its prejudice. As regards the record, St. Louisans can say with pardonable complacency that their city is now the healthiest on the continent, and doubtless as healthy as any large city elsewhere. The rivalry that would oppress a neighbor, even to the extent of grossest misrepresentation or deliberate denial of patent facts, is one of the unhappy capacities of human nature that will on occasion make themselves manifest. The

present instance, however, admits of a corrective, since it implies a degree of apprehension that is flattering to the object of persecution.

It is the object of this article to point out the natural causes which, encouraged by art, have of necessity made St. Louis a most healthful place of residence.

The fitness of any locality for habitation depends, as is well known, upon these three conditions: capability of drainage, and purity of air and water. While a city may survive an atmosphere not altogether wholesome, or water supplied from sources not above suspicion, its existence must be endangered by imperfect drainage. The warmer the climate, the more speedily and disastrously do the evil consequences of bad drainage manifest themselves; where the summers are cool and winters prolonged, they may not express themselves in the form of frequent and sweeping epidemics, but will give rise to a numerous class of diseases equally virulent, but less widely distributed; in the place of cholera, yellow fever, congestive fevers, etc., such scourges as diphtheria, scarlet fever, typhoid, and typhus.

A glance at the topography of the county of St. Louis will suffice to note its capacity for perfect drainage. The county lies between the Mississippi, Missouri, and Meramec Rivers, draining into them from all sides, through numerous channels. As a water-shed, it has a general altitude above the Mississippi of two hundred feet. The site of the city of St. Louis was most happily chosen, possessing, as it does, the general topographical characteristics of the county, but so modified as to admit of the building of a great city without costly levelling and filling. Next the river it consists of a series of terraces, attaining at Seventeenth Street, one mile westward, the height of one hundred and fifty feet; beyond this line the territory is undulating, — a succession of long, gently swelling waves, rising at the distance of four miles from the Mississippi to the height of about two hundred feet. The geological formation of the

county is clay, limestone, and coal measures, which formation obtains also at St. Louis. The compact red clay directly overlies the limestone, and averages in thickness from ten to twenty feet. A surface almost impenetrable by water, and exhibiting no extensive levels, possesses all the conditions requisite for perfect drainage. St. Louis owes much of its enviable healthfulness to this peculiarity of terrain. The imperviousness of the clay is well demonstrated where excavations are made next old sewers and vaults; the discolorations due to absorption of the liquid contents will be found to extend but a few inches into the surrounding soil. Yet the chief of the United States Signal Service Bureau, commenting upon the severe heat of last summer, is reported to have asserted, respecting St. Louis, that the heat in this city must be dangerous because of the *porosity* of the soil, which allowed the atmosphere to be kept saturated with moisture, thus inviting sun-strokes. A few days' study of practical geology with pick and spade in a St. Louis sewer-cut would be of value to Chief Myers. It may be remarked, by the way, that this clay makes the best of red brick, — firm, and of rich color; it requires only to be pulverized, and is then ready for the press machine, no tempering nor admixture with other substances being necessary. As the limestone affords the material used in foundation-walls, for street-paving, curbing, and guttering, as well as for the manufacture of lime, it will be seen that St. Louis has the peculiar good fortune to possess within its own limits all the chief materials — with the exception of wood and iron — for its construction, the river harbor supplying sand in any quantity.

According to the last report of the Board of Public Improvements, St. Louis has nearly one hundred and eighty miles of sewers. The Water-Works Department reports the average daily consumption of water to be 22,250,000 gallons, the most of which passes as waste into the sewers. This waste, together with the heavy rains which fall occa-

sionally during the summer months, keep the sewers free from accumulations, the more readily on account of the steep grades which are allowed in the system. The sewage passes directly into the Mississippi, whose mighty current, heavy with sand and clay, sweeps by at the rate of from four to five miles per hour, scouring its banks, and thoroughly clearing away the city refuse. This speedy and complete removal of the sewage is obviously a most vital matter, and herein many large cities are at fault. It is estimated that, at the ordinary stage of the river, about one million gallons of water are carried past the city per second. A comparison of the drainage of St. Louis with that of several other large cities will serve to emphasize its superior excellence. The Board of Health of New York reports, 1873, under the head of "Wharves and Piers," that along the water-front, "fermenting and decomposing animal and vegetable refuse in large quantities is constantly deposited, which at low tide is exposed to the sun, and emits odors (?) dangerous to life and detrimental to health. Dredging is at present the only mode of relief." The board recommends construction of bulkheads to favor the action of the tide.

A rather old report of the New York Metropolitan Board, 1868, contains the following: The superintendent of the work of cleaning the beach, from the city (Brooklyn) line to Fort Hamilton, a distance of four or five miles, "reports the removal of one thousand nine hundred and twenty-seven dead animals, including sixty-five horses and twenty-five cows, besides a large quantity of butchers' offal. Two hundred and seventy-one beds and two hundred and forty-seven pillows, thrown from emigrant ships, were also found on the beach and destroyed. The incoming tide, with a south or south-west wind, drives this refuse upon the shore." I cite this report, to show the insufficiency of tidal flow to bear off sewage.

London suffered excessively from its accumulation of sewage in the Thames, until the present costly embankment

and sewer system were established; still the Thames at London is most uninviting, as a strong tide sets up the river far above the city, bearing the refuse to and fro in its ebb and flow. It is estimated that no less than fourteen million cubic feet of sewage is daily discharged by London into the Thames. Such a stygian tide will remind one of the odorous stream that winds through the centre of Chicago, at once its great commercial thoroughfare and *cloaca maxima*. The low water-shed intervening between the origin of this creek and of the Illinois River has been cut through so as to allow the flow of the former into the Illinois; but this flow must be at times uncertain, as I have certainly observed it to be lakewards; and when the low-lying territory about Chicago is flooded, as sometimes occurs, the lake receives a great part of the excess, together with the sewage taken up by it. This pollution of the lake-front is a serious matter, apart from the nuisance of drainage into a currentless body of water, since the water-supply is taken from the lake opposite the city. Amongst the material gathered by the commission appointed by Congress to investigate the nature, cause, etc., of the cholera epidemic of 1873, is to be found a communication setting forth the bad condition of a part of Chicago as to drainage, which will illustrate the ineligibility of a porous, low-lying territory for habitation. The communication is from a local physician, "a careful observer," and is to be found on pages 217-219 of the report:—

"This district (in which most of the so-called cholera cases occurred) is one of the lowest parts of this notoriously low city. The soil is a very porous, sandy loam, underlaid by a stratum of quicksand; near the surface of the ground, water stands throughout the year." The writer also states that an average specimen of the purest water obtained from the wells of the same district was found to contain over ninety-one grains of oxidizable organic matter

to the gallon. The commission is also informed that, owing, among other causes, to the imperfect drainage, the odors from the great stock-yards and adjacent establishments were such "that many times, when the south-west wind came up suddenly, vomiting and purging were caused even among the acclimated."

The atmosphere of St. Louis is uncontaminated by exhalations from stagnant sewage or water-sodden soil, while its elevation and pleasing irregularity of site invite a continuous circulation.

There being no natural obstacles to the extension of the city it has spread itself over a territory of about sixty-two and five-tenths square miles. The houses are not packed closely together, and huge tenements are uncommon. Eighty-six miles of street-railroads make the suburbs accessible, and favor dispersion. The city is nobly endowed with parks, those "lungs of cities." There are eighteen, ranging in size from about two acres to one thousand three hundred and seventy-one acres, their total area being two thousand one hundred and seven acres. The *Harper's Weekly* indulged, in the midst of the heats of last summer, in a flight of editorial fancy, and pictured to its pitying readers an ideal St. Louis; not a city set upon a hill, but an abject town, "situate in a valley, surrounded by hills, so that every breeze is cut off, and condemned to swelter in a reservoir of hot air." I am not sure of every word of the quotation, but am of the chief expressions, since they struck me as most extraordinary, appearing in the columns of a publication of such standing and pretensions to exact topography. It were charitable to suppose that the dog-days had affected the editorial brain, or that he invented the story to lessen his own sufferings at the time.

An abundant supply of good water is essential to the healthfulness of a city; in this respect St. Louis is again highly favored. Water, to be fit for drinking purposes,

must not contain organic matter in appreciable quantity. The clearest of well-water, limpid and sweet, may yet be poisonous through the presence of a minute quantity of organic matter, only to be detected by careful analysis. Large cities, as a rule, have difficulty in obtaining a sufficient supply of potable water. Not only are the sources apt to prove inadequate to the draught, but in the course of time they become unfit. It is not improbable that the savage laying waste of a whole country, and the sowing of salt upon the sites of its cities, was not an unmitigated evil in days gone by. Mankind pollutes nature. In its ignorance and blind selfishness it seizes the present advantage, forgetful of the past and reckless of the future. The inhabitants of the town saturate the region with their waste ; even in death they continue to poison the soil. The springs and streams supplied by filtration and washings from the infected land avenge themselves fearfully. Epidemics seek out the congenial spot ; continual distillations exhale, to creep insidiously into the homes of men, to blight and to destroy. Against such ills, what avail days of penance, the sacrifices, the solemn procession, the lamentations of a people ! Fire and the sword, and the laying waste are the only remedies ; a desert must be made, to be reclaimed when purified by time. Beneficent science, from a second Sinai, has revealed to us the commandments of the Creator, that the life of mankind may be ordered in harmony with the laws of nature, and not be annihilated in a hopeless conflict.

The visitor crossing the bridge at St. Louis will note the turbidity of the river, boiling and rushing below ; he will, perhaps, compassionate the people who must draw from such a source for domestic uses. He will be surprised afterward, at table, to learn that the clear, sweet water in his glass is from that same current. The turbidity of the Mississippi is due to an admixture of clay and sand, which of course may be readily separated, leaving the water unaffected, since there is no true discoloration. But even the unfiltered water is per-

fectly potable, as it contains comparatively but little organic matter. It is said that ship captains at New Orleans prefer to fill their tanks from the muddy Mississippi, as the water, when settled, remains sweet for an indefinite length of time. Properly speaking, it is the Missouri water that St. Louis uses. This impetuous stream overwhelms the Mississippi with its yellow floods, driving it over to the Illinois side, and keeping distinct even below St. Louis. Its annual discharge is nearly one-fifth that of the lower Mississippi itself; it really is the Mississippi. Its waters are gathered from a basin distinguished from all others of the great Mississippi Valley by containing a large area covered with lofty mountain chains, amidst which are its chief sources, by the upper Missouri, Yellowstone, and Platte. (Report upon the Physics and Hydraulics of the Mississippi River; Humphreys and Abbot, U. S. A.) The following description, taken from Lewis and Clark's Travels, of the majestic exit of the upper Missouri from the mountains, will give additional relish to his beverage as the St. Louisian quaffs of its waters:—

“The rocks approach the river on both sides, forming a most sublime and extraordinary spectacle. For five and three-quarters miles these rocks rise perpendicularly from the water's edge to the height of nearly 1,200 feet. They are composed of a black granite near the base, but from the lighter color above, and from the fragments, we suppose the upper part to be flint of a yellowish brown and cream color. Nothing can be imagined more tremendous than the frowning darkness of these rocks, which project over the river and menace us with destruction. The river, 350 yards in width, seems to have forced its channel down this solid mass, but so reluctantly has it given way, that during the whole distance the water is very deep, even at the edge; and for the first three miles there is not a spot, except one of a few yards, in which a man could stand between the water and the towering perpendicular of the mountain.

The convulsion of the passage must have been terrible, since at its outlet there are vast columns of rock torn from the mountain, which are strewed on both sides of the river, — the trophies, as it were, of the victory. This extraordinary range of rocks we called the Gates of the Rocky Mountains.”

As already stated, it is estimated that about one million gallons of water passes St. Louis per second. As the water-works are situated in the upper part of the city, the supply is not likely to be much affected by droughts. Again, the testimony of other cities may be called upon to increase the content of St. Louis.

New York is more favored than its sister cities of the Atlantic coast in respect to its water supply, yet the Board of Health has found it necessary to vindicate the Croton water against the charges of being “foul, putrid, miasmatic,” etc. The Croton, brought into the city by an aqueduct forty-five miles in length, is collected from a hilly country, having a drainage area of three hundred and thirty square miles, and containing numerous rivulets, ponds, and small lakes, that finally discharge into Croton Lake, formed by damming the stream of that name. The report of 1871 states that in this territory there are but few manufactories, and that the flat bogs are fewer and less extensive than was expected. The dairy interest seems to hold the chief part of the land. Jealous supervision on the part of the State will be needed to preserve the streams tributary to the Croton reservoir from dangerous pollution. Even now the Croton, like all sources of moderate extent in the midst of an inhabited region, when in freshet may present such an unfortunate condition as is described in the report for 1869, page 422: “The water was strongly tinted brown, and contained an unusual amount of decayed vegetable matter, with sand; and also dyed fibres of wool and cotton, derived from clothing, rags, dust, and the like; and epithelial cells, such as line the various mucous canals of the higher animals. These cells were supposed to come from manure, as their

most likely source, and to indicate pollution from the overflow of river banks, or cultivated or pasture lands." At times, the water has been made disagreeable by the presence of minute vegetation; but this is common to all water taken from similar sources.

Cambridge, seat of Harvard College and suburb of Boston, illustrates the danger of relying upon a drainage of small area for water supply. The last report of the State Board of Health of Massachusetts devotes some forty-three pages to the sanitary report of Cambridge, which cannot be read with much satisfaction by a citizen. *The Nation*, January 23, 1879, prints the following, in connection with a notice of the petition laid before the Council of the city of Cambridge for the protection of the purity of the water supply of that city: "The water comes from a pond on the borders of the city; and a large slaughter-house is being erected on the further side, in the adjoining town of Belmont, near enough to threaten very serious injury and arouse great alarm. No less than three city sewers empty on the swampy tract immediately adjoining the pond; and this swamp, with almost no outlet, and separated from the pond only by embankments and an imperfect wooden bulkhead, had already been complained of as an intolerable nuisance by another adjoining city." This from *The Nation* will answer instead of a lengthier excerpt from the report. Truly, much learning and good repute will not save from defilement and vulgar encroachments. The last report of the Boston Board of Health calls the attention of the authorities to the continued shocking state of things in the midst of a thickly populated part of that city,—in which, also, the City Hospital is situated,—where is an enormous open sewer, the Roxbury Canal, in which "the sewage and mire lie a fathom deep, bubbling their gases through the black, putrid water." The State report complains that, "during the coming season, as in years past, every breeze that blows from the west will come more or less laden with

the pestilential vapors that have so long brooded over the Back Bay Flats." All these ills, so poetically described, may be the cause of that mental disturbance which has impelled that excellent publication, the *Boston Medical Journal*, to refuse to print the St. Louis health reports, since they would appear to make that city more healthful than Boston, — a palpable heresy.

Brooklyn is supplied with water by the Ridgewood Works, from ponds and rivulets draining an area of about eighty square miles. (Metropolitan Board of Health Report, 1867.) The liability to contamination is considered to be much greater than in the case of the Croton. A severe drought will assuredly affect this supply, as Long Island has no great elevation, and the same sources must be drawn upon by neighboring villages.

The report of the Board of Health of Philadelphia, 1874, gives a deplorable account of the condition of the Schuylkill River, from which that great city draws its supply: "The river drains a vast agricultural territory, and receives the drainage from two large and growing cities, besides many smaller towns, several of which are centres of manufacturing industries." The population of these various towns, according to census of 1870, is over 90,000. Within ten miles of the water-works dam there is discharged the sewage from a number of manufactories, woolen and cotton, paper, and gas-works. Not far from the city, "from both sides of the river, is poured an enormous quantity of animal refuse from slaughter-houses." The board may well call the attention of the citizens to this wholesale pollution of their drinking-water, a pollution that at a critical season of threatening epidemic might imperil the lives of the whole population. May it not, indeed, be due to this poisoned potion that so much serious sickness prevailed among the visitors to the Centennial Exposition?

The American in Europe, with "conscientious scruples," but vinous proclivities, finds both solace and justification in

the deep-rooted popular prejudice that there obtains against the internal use of water. To the non-travelled, surrender to this prejudice may savor of hypocrisy; but there is apt to be reason at the bottom of popular notions.

Wells or open springs in old, populous communities are always suspicious; drains, cess-pools, and grave-yards in the course of time will infect the soil. During a cholera epidemic in London, five hundred deaths in a single week could be traced to the use of water from a well situated in a naturally healthy locality, and so noted for its cool, sparkling water that people at their country homes sent daily into the city for it, and so fell victims. Nor are the streams drawn upon by the large towns of Europe of unimpeachable purity; like the Schuylkill, already mentioned, they are apt to be polluted by bordering nuisances. London is supplied with water from the drainage of the Thames water-shed, and has suffered much from the consequences of using water from such an obviously dangerous source. Even in 1608 it was found desirable to take other than the Thames water, and a tributary, the river Lea, was tapped; at the present time about one-half the water consumed is obtained from this source, the Thames itself furnishing the rest. Reference has already been made to the prodigious works completed by the city for the purpose of discharging its total sewage into the river some distance below. Still the purification is not complete. The pollution of its water sources was the cause of many deaths in London during the cholera epidemics of 1844 and 1856.

The prevention of the pollution of streams is a great and vital question of the day; the English, French, and German governments have recognized the necessity of arriving at a satisfactory solution, and are actively engaged upon the work. The United States should not be behind in this important business. Happily, the last Congress appointed a long-needed National Board of Health, which, if it be met by the different States in a spirit worthy the age, will prove

of incalculable good to the whole people. Every State should have its own board, and thus be enabled to coöperate with the general supervising and advisory board. Science demands that we open our eyes and look where she directs, or we must perish in our heedlessness and apathy. The prime minister of Great Britain, Lord Palmerston, shocked Scotland when, in answer to a message from the Edinburgh presbytery desiring the queen to appoint a day of fasting and humiliation, that the cholera epidemic of 1853 might be averted through divine interposition, he calmly advised that *it was better to cleanse than to fast*; a simple and plain statement, but what a revolution in thought it implies! All this may seem to be a digression from the subject in hand, but to any one familiar with the requirements of health, and their persistent violations, nothing here set down will appear foreign to the general spirit of this paper. An obscure hamlet in the jungle of India, or upon the remotest plain of Tartary, may, through neglect of the plainest hygienic rules, cradle a catastrophe that shall suddenly arise to ravage the continents and annihilate millions. In every possible way the prime necessity of cleanly living needs to be insisted upon.

The foregoing comparisons I have made, not merely to set forth more distinctly the hygienic advantages of St. Louis, by furnishing a dark background at the expense of her compeers, but to exhibit as well the sanitary conditions of the designated cities, and, by good fortune, perhaps thereby to assist the several boards of health in their crusades against local evils. Possibly, adverse criticism of the St. Louis board's report may be made on the ground that the stated population is an exaggeration; but reduce it to 400,000, a diminution not justified by the results of fair estimation, and there still remains a favorable ratio of 14.15 per 1,000, — a ratio lower than any of the given list. Some will assert that the picture of St. Louis is here too brightly colored. That St. Louis is an earthly paradise I shall not attempt to maintain;

the disagreeables are too patent. The limestone macadam gives rise to an intolerable dust, unless kept sprinkled ; the numberless chimneys puff out the murky residue of bituminous fuel ; and, in addition, as in the case of most other cities of the great Mississippi Valley and of the Atlantic slope, malaria haunts the suburbs. All these, however, are inconveniences more or less annoying, but not incompatible with longevity. The limestone dust we believe to be a famous disinfectant ; the sulphurous smoke probably is so as well, — our best friends are sometimes disguised. The malaria is of a mild form, and for the most part disappears as the new territory is sewerred and built upon.

In conclusion, I would strongly advise all interested in the health of St. Louis to read the reports of the sanitary officer and of the clerk of the Board of Health, as published in the last issue of the municipal documents. In small and well-ordered space, they contain much of paramount value to the well-being and good reputation of the city.

